

REMARKS

The Present Invention

Claims 1-23 are currently pending. All of the pending claims are directed to a method of planarizing or polishing a memory disk by abrading at least a portion of the surface of the memory disk with a polishing system comprising (i) a polishing composition comprising water, an oxidizing agent, and about 0.04 M or higher phosphate ion or phosphonate ion, and (ii) abrasive material.

The Amendments to the Claims

Claims 1 and 4 have been amended to delete the phrase "or rigid" as redundant. No new matter has been added by way of these claim amendments. The precise amendments to the claims, as well as the pending claims as amended, are set forth on attachments hereto.

Summary of Examiner Interview

Applicants thank Examiner Shakeri for the courtesies extended to applicants' undersigned attorney, John Kilyk, and technical advisor, Caryn Borg-Breen, during the telephonic interview of July 17, 2002. The obviousness rejection was discussed, consistent with the remarks set forth herein.

Summary of the Office Action

Claims 1-14 and 17-23 have been rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over Huynh et al. in combination with James et al. (i.e., U.S. Patent 6,069,080). Claims 15 and 16 have been rejected as allegedly unpatentable under 35 U.S.C. § 103(a) over Huynh et al. and James et al. in further combination with Ishitobi et al. (i.e., U.S. Patent 6,152,976).

Rejection of Claims 1-14 and 17-23 Under Section 103(a)

The final Office Action alleges that claims 1-14 and 17-23 are obvious under Section 103(a) in view of the combined disclosures of Huynh et al. and James et al. In particular, the Office Action relies on Huynh et al. for its disclosure of a CMP system comprising water, an oxidizing agent, about 0.04 M or higher phosphate ion or phosphonate ion, and abrasive material, but recognizes that Huynh et al. does not disclose the use of the CMP system in a method of planarizing a memory disk, as recited in the pending claims. The Office Action relies on James et al. for its recitation of a CMP system for use in planarizing substrates including memory disks and semiconductor devices, but recognizes that James et al. does not disclose a CMP system comprising about 0.04 M or higher phosphate ion or phosphonate ion.

However, the Office Action alleges that it would have been obvious to combine the disclosures of these references in such a way as to arrive at the present invention.

To establish a *prima facie* case of obviousness, three basic criteria must be met: (a) there must be some suggestion of motivation to modify the reference or to combine reference teachings; (b) there must be a reasonable expectation of success; and (c) the prior art references must teach or suggest all the claim limitations. M.P.E.P. 2142

(a) There Is No Suggestion Or Motivation To Combine The Cited References

The Section 103(a) rejection is improper because there is no suggestion or motivation to combine the references in such a way as to arrive at the claimed subject matter. In order to set forth a *prima facie* case of obviousness based on a combination of references under Section 103(a), the Office Action must identify a “clear and particular” teaching, suggestion, or motivation to combine the references. *In re Demiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999), *abrogated on other grounds by In re Gartside*, 203 F.3d 1305, 1316, 53 U.S.P.Q. 2d 1769, 1769-1770 (Fed. Cir. 2000); *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998); *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051 (Fed. Cir. 1988). As the Federal Circuit has stated, “combining prior art references without evidence of such a suggestion, teaching or motivation simply takes the inventor’s disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight.” *In re Demiczak*, 175 F.2d at 999.

In support of the Section 103(a) rejection, the Office Action alleges that it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to apply the slurry of Huynh et al. to the polishing of a memory disk, “since it is known in the art to use a CMP system for manufacturing of both semiconductor devices and memory disk,” citing James et al. at col. 1, lines 34-37. The Office Action implies that the disclosure of James et al. teaches that any polishing system that is shown to be useful for polishing semiconductor devices is also useful for polishing memory disks, and vice versa. However, such an interpretation of James et al. is erroneous. The polishing system disclosed by James et al. comprises (1) a fixed abrasive polishing pad and (2) a polishing fluid. James et al. does not disclose any required components for the polishing fluid and only suggests that the polishing fluid is “preferably water based,” “may comprise polishing particles,” and “preferably comprises a pH modifier.” While it is true that James et al. suggests that the polishing system comprising the fixed abrasive pad and the undefined polishing fluid can be used in the manufacture of semiconductor devices, memory disks, or the like, it is erroneous to suggest that the disclosure of James et al., when taken as a whole, provides a nexus for the application of any semiconductor polishing system to the patentably distinct art of polishing memory disk substrates.

Even disregarding the Office Action's misinterpretation of the cited references, Huynh et al. and James et al. do not provide any suggestion or motivation to combine the references in such a way as to arrive at the present invention. Rather, these references merely recite individual elements of the claimed method. In particular, although James et al. states that the polishing fluid "optionally [comprises] a pH buffer, surfactant, chelating agent, and/or oxidizer," James et al. provides no guidance whatsoever regarding when such optional components should be used, what type of such optional components should be used, and in what amount the optional components should be used. Thus, even if one of ordinary skill in the art was motivated to use a polishing fluid containing water, abrasive particles, and a pH modifier, in a method of polishing a memory disk, there is no teaching to suggest which of the optional components to include and in what amounts.

The Office Action asserts that the ordinarily skilled artisan, given the disclosure of James et al. as a guide, would be motivated to select the polishing composition disclosed by Huynh et al., despite the fact that there is nothing in James et al. that points to such a combination (as opposed to, for example, the combination of James et al. with a different reference that discloses a very different polishing composition). The only connection between the cited references seems to be the fact that James et al. suggests the preferable use of water and a pH modifier in the polishing composition and Huynh et al. discloses a polishing composition comprising water with a pH modifier, but so do hundreds, if not thousands, of other references disclosing very different polishing compositions. Indeed, Huynh et al. is not directed to a method of polishing memory disks, but rather is directed to a method of polishing semiconductor substrates. The Office Action does not provide evidence as to why the ordinarily skilled artisan would select the polishing composition of Huynh et al. over other prior art polishing compositions that also disclose the use of water and a pH modifier that are even directed to a method of polishing memory disks. For example, U.S. Patent 4,929,257 discloses a method of polishing a memory disk using a polishing composition comprising an abrasive, water, a pH modifier, a polishing accelerator, and a surface modifying agent. Similarly, U.S. Patent 6,015,506 discloses a method of polishing a memory disk using a polishing composition comprising an abrasive, water, a pH modifier, an oxidizing agent, and a catalyst with multiple oxidation states. Moreover, the Office Action does not provide evidence as to why the ordinarily skilled artisan would select the polishing composition of Huynh et al. over other prior art polishing compositions that also disclose the use of water, a pH modifier, and a pH buffer as in Huynh et al. For example, U.S. Patents 5,340,370 and 5,516,346 disclose polishing compositions comprising an oxidizing agent, abrasive, a pH modifier (e.g., acetic acid), and a pH buffer (e.g., potassium acetate).

Similarly, U.S. Patent 5,700,383 discloses a polishing composition comprising an abrasive, a chelating agent, and a pH buffering system (e.g., citric acid and potassium citrate).

The Office Action further asserts that the ordinarily skilled artisan, given the disclosure of Huynh et al. as a guide, would be motivated to combine the polishing composition of Huynh et al. in the method of polishing a memory disk of James et al. Again, there is nothing in Huynh et al. that even remotely points to such a combination. James et al. is directed to a polishing system comprising a fixed abrasive polishing pad; however, Huynh et al. never discloses or suggests that the polishing composition could be used with a fixed abrasive polishing pad. Even given the combination of references, there is nothing in the references that would suggest that using a pH buffered polishing system is beneficial in the polishing of memory disk substrates.

Given that the disclosure of James et al. lacks any guidance regarding the type of polishing composition to be used for polishing a memory disk substrate, and given that the disclosure of Huynh et al. lacks any suggestion that the pH buffered polishing composition could be used for the polishing of memory disk substrates, one of ordinary skill in the art would not be motivated to combine the cited references, except with the improper hindsight of the present invention.

(b) There Is No Reasonable Expectation of Success

Even if the ordinarily skilled artisan were provided with the combination of James et al. and Huynh et al., they would have no reasonable expectation of success that the use of a pH buffer in a method of polishing a memory disk would be advantageous. As discussed above, neither James et al. nor Huynh et al. teaches or suggests that the use of a pH buffer in a polishing system for polishing memory disks is desirable, or even possible. Moreover, phosphates are just one of a list of possible pH buffering agents. In the absence of at least a teaching that controlling the pH was important when polishing memory disks, and a teaching that phosphates were particularly good pH buffering agents in the context of polishing memory disks, the ordinarily skilled artisan would not have had a reasonable expectation that the combination of the teachings of the cited references would result in a successful method of polishing memory disks.

(c) The Cited References Do Not Teach or Suggest All the Claim Limitations

The cited references, either alone or in combination, fail to teach or suggest all the elements of the invention as recited in the pending claims. In particular, the cited references do not disclose a method of polishing a memory disk comprising abrading the substrate with a CMP system comprising about 0.04 M or higher phosphate ion or phosphonate ion. James et al. does not even mention a phosphate ion or a phosphonate ion, let alone disclose the use

of 0.04 M or higher concentration phosphate ion or a phosphonate ion. Huynh et al. discloses phosphate ions among a laundry list of possible buffering agents and suggests that those buffering agents are preferably used in a concentration of 0.01 M to 0.1 M. Huynh et al. does not even remotely recognize the significance of using phosphate ions over all the other possible buffering agents, the particular significance of using 0.04 M or higher phosphate ions, or the desirable effects on the polishing rate that arise from using 0.04 M or higher phosphate ions in a method of polishing a memory or rigid disk. James et al. provides no suggestion for how to modify the composition disclosed by Huynh et al. in order to arrive at the invention recited in the pending claims. Indeed, the ordinarily skilled artisan, if provided with the combination of cited references, would still face extensive experimentation, beyond the realm of "routine optimization," before they could arrive at the precise components and beneficial concentration of at least the phosphate ions or phosphonate ions range discovered by the applicants and recited in the pending claims.

For the foregoing reasons, the Patent Office has not met its burden of showing a clear and particular suggestion or motivation to combine the disclosures of the cited references in such a way as to arrive at the claimed invention. Accordingly, the Section 103(a) rejection should be withdrawn as to all the pending claims.

Rejection of Claims 15 and 16 under Section 103(a)

The final Office Action alleges that claims 15 and 16 are obvious under Section 103(a) in view of Huynh et al. in combination with James et al. and Ishitobi et al. In particular, the Office Action recognizes that neither Huynh et al. nor James et al. disclose the use of 0.1 to 5 M oxidizing agent, but alleges that Ishitobi et al. teaches an abrasive composition comprising greater than 0.01 wt.% for polishing a memory disk. Thus, according to the Office Action, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the composition of Huynh et al. with the wt.% of oxidizer as taught by Ishitobi et al. to enhance the abrading action. However, Ishitobi et al. does not supply the missing teachings of Huynh et al. and James et al., which have been discussed above with respect to the rejection of claims 1-14 and 17-23. Accordingly, the Office Action does not set forth a *prima facie* case in support of the Section 103(a) rejection of claims 15 and 16, which rejection should be withdrawn.

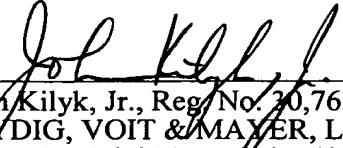
Conclusion

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the

In re Appln. of Fang et al.
Application No. 09/595,227

Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,


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Date: August 12, 2002

CERTIFICATE OF MAILING

I hereby certify that this RESPONSE TO OFFICE ACTION (along with any documents referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231.

Date: August 12, 2002





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RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2766

PATENT
Attorney Docket No. 99154X204201

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Fang et al.

Art Unit: 2766

Application No. 09/595,227

Examiner: Hadi Shakeri

Filed: June 16, 2000

For: **METHOD FOR POLISHING A
MEMORY OR RIGID DISK WITH
A PHOSPHATE ION-
CONTAINING POLISHING
SYSTEM**

**AMENDMENTS TO CLAIMS
MADE IN RESPONSE TO OFFICE ACTION DATED JUNE 13, 2002**

Amendments to existing claims:

1. (Amended) A method for planarizing or polishing a surface of a memory [or rigid] disk comprising abrading at least a portion of the surface with a polishing system comprising (i) a polishing composition comprising water, an oxidizing agent, and about 0.04 M or higher phosphate ion or phosphonate ion, and (ii) abrasive material.

4. (Amended) The method of claim 1, wherein the surface of the memory [or rigid] disk comprises nickel-phosphorus.